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September 29, 1999

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W. TW-A325
Washington, D.C. 20554

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SEP 29 1999

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

EX PARTE OR LATE FILED

Re: Ex Parte Submission, Revision of Part 15 of the Commission's Rules
Regarding Ultra-Wideband Transmission Systems, ET Docket No. 98-153

Dea: Ms. Roman Salas:

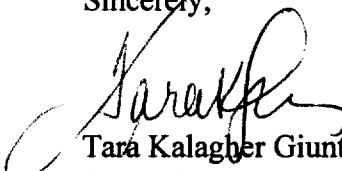
This letter is to advise you that, on September 28, 1999, the undersigned, along with Mr. Roberto Aiello and Ms. Debby Hindus, of Interval Research Corporation ("Interval"), met with the following individuals at the Federal Communications Commission to discuss the above-referenced proceeding:

- Mark Schneider, Senior Legal Advisor to Commissioner Susan Ness;
- Peter Tenhula, Legal Advisor to Commissioner Michael Powell;
- Adam Krinsky, Interim Legal Advisor to Commissioner Gloria Tristani;
- Robert Calaff, Interim Legal Advisor to Commissioner Harold Furchtgott-Roth; and
- Ari Fitzgerald, Legal Advisor to Chairman William Kennard.

Pursuant to Section 1.1206 of the Commission's Rules, 47 C.F.R. §1.1206, an original and a copy of this letter, along with copies of the documents provided at these meetings, have been submitted for inclusion in the public record.

Please contact me at (202) 736-1809 if you have any questions concerning this letter.

Sincerely,


Tara Kalagher Giunta
Counsel to
Interval Research Corp.

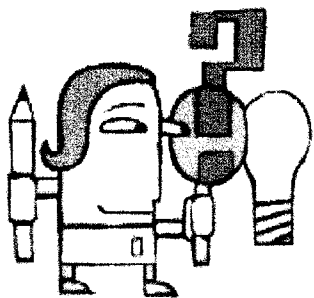
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Letter to Ms. Roman Salas
September 29, 1999
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COUDERT BROTHERS

Encl.

cc: Mark Schneider (w/o encl.)
Peter Tenhula (w/o encl.)
Adam Krinsky (w/o encl.)
Robert Calaff (w/o encl.)
Ari Fitzgerald (w/o encl.)



Interval Research Corporation

*Presentation on Ultra-Wideband Transmission Systems
ET Docket No. 98-153*

Interval Research Corporation

Roberto Aiello

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Coudert Brothers

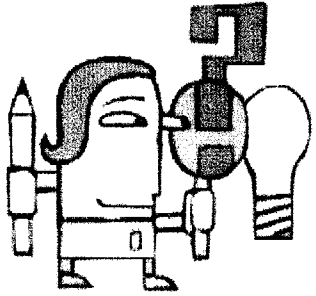
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**Attorneys for Interval
Research Corporation**



Summary

Interval's background

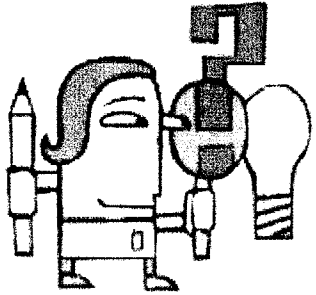
Ultra-wideband ("UWB") technology

Regulatory activities

Research results

- ◆ **vision of the future**
- ◆ **interference**
- ◆ **aggregation**

Policy recommendations



Interval Research

Interval Research Corporation, located in Palo Alto, California, is a research laboratory founded in 1992.

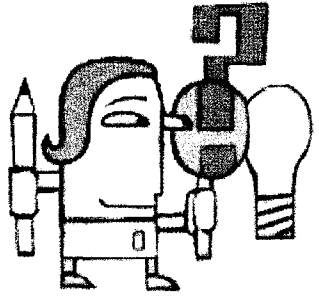
Founders: Paul G. Allen, a visionary high technology entrepreneur and forth largest cable operator, and Dr. David E. Liddle, a computer industry veteran with deep roots in research and development.

Interval's goal is to expand the ways in which people communicate, learn, relax, and live with new technology.

Interval employs about 100 researchers, most of them with advanced degrees.

Interval has received over two dozen patents, and published over 200 scientific articles.

Interval supports research and collaborates with numerous universities, including MIT, Stanford, CMU and NYU.

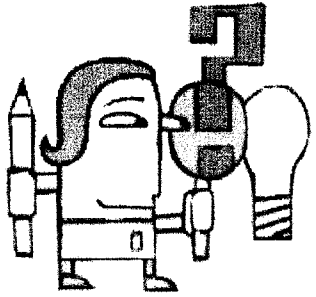


Interval Creates New Consumer Experiences

Interval is a laboratory and incubator for new businesses in broadband applications and services, consumer devices, interaction design, and advanced technologies.

Interval brings an interdisciplinary approach to research. Its staff includes computer scientists, designers, engineers, filmmakers and entrepreneurs.

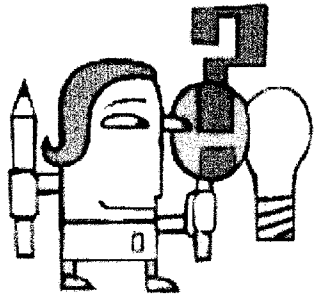
Interval's business development team works with researchers and capitalizes on its intellectual property by launching spin-off companies and partnerships to take concepts to market.



Interval Creates New Consumer Experiences

Interval already has made breakthroughs in developing seedling technologies and building commercial industries around them by spinning-off several start-up companies that are now pursuing commercial endeavors.

Interval is currently developing various communications applications and technologies, including those that involve UWB technology.



UWB Is A Valuable Technology

Safety

- ◆ location of people buried by debris after earthquakes
- ◆ side auto collisions

Environment

- ◆ aging pipes location
- ◆ highways and runways flaws detection

Medical

- ◆ wireless implants
- ◆ hearing aids

Education

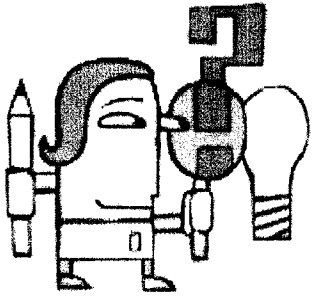
- ◆ classroom wiring
- ◆ school/library Internet access

Assistance to the elderly, disabled

- ◆ remote controlled home
- ◆ remote monitoring

Consumers

- ◆ broadband access
- ◆ broadband networking
- ◆ personal wearable computing



A Brave New World of Communication

Always in touch

- ◆ hands free, great sounding next generation phones
- ◆ simple “presence” devices

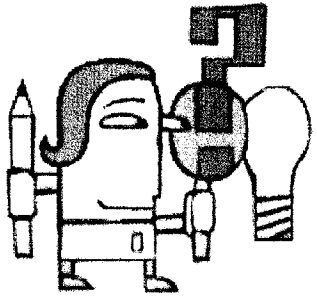
Toys, games

Safe and sound

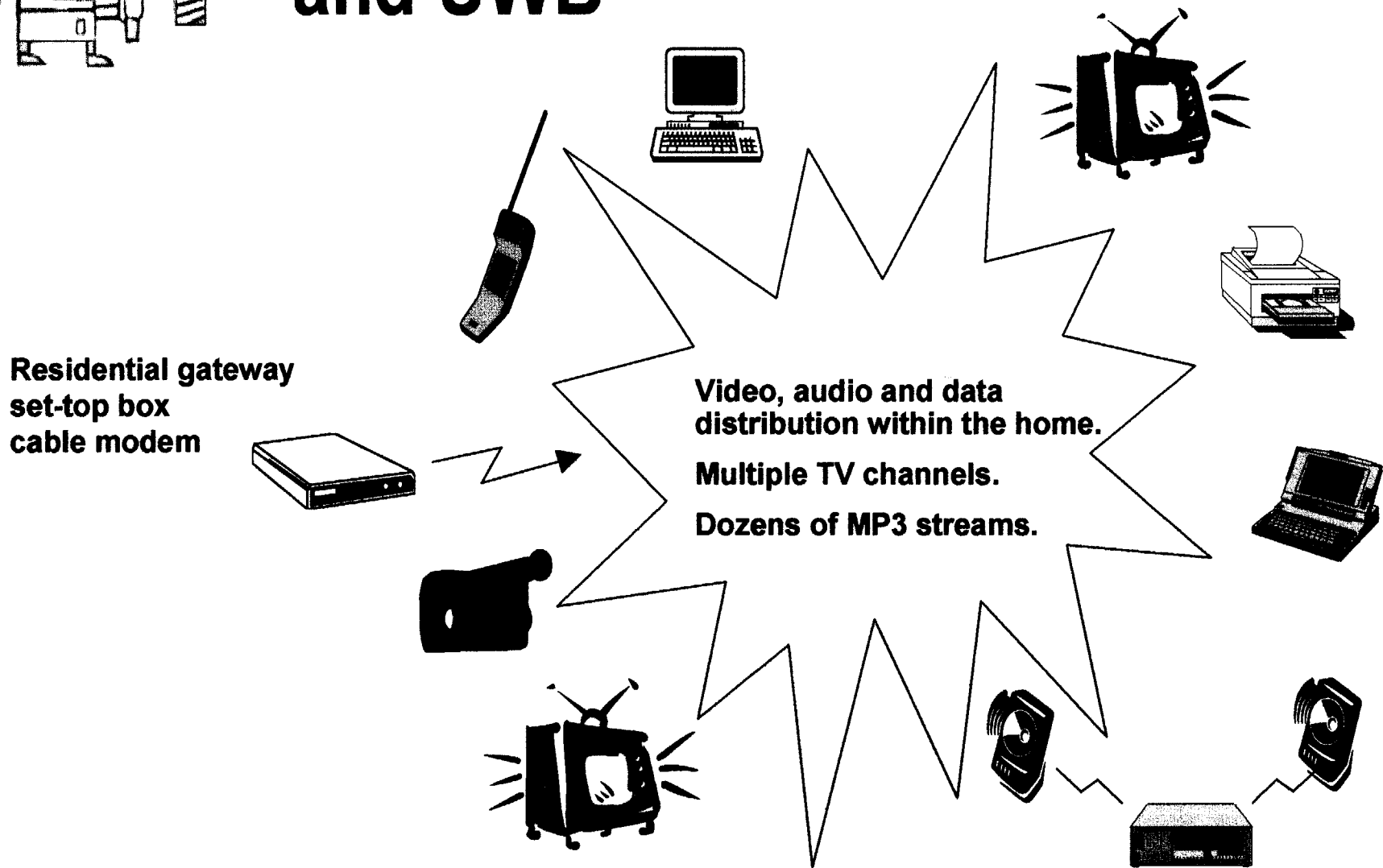
- ◆ medical monitoring
- ◆ self-driving cars

Nothing but ‘net

- ◆ personal, wearable broadband
- ◆ ubiquitous networking in schools
- ◆ Internet access as a right, not a privilege



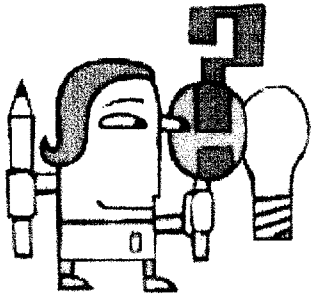
Broadband Home Networking and UWB



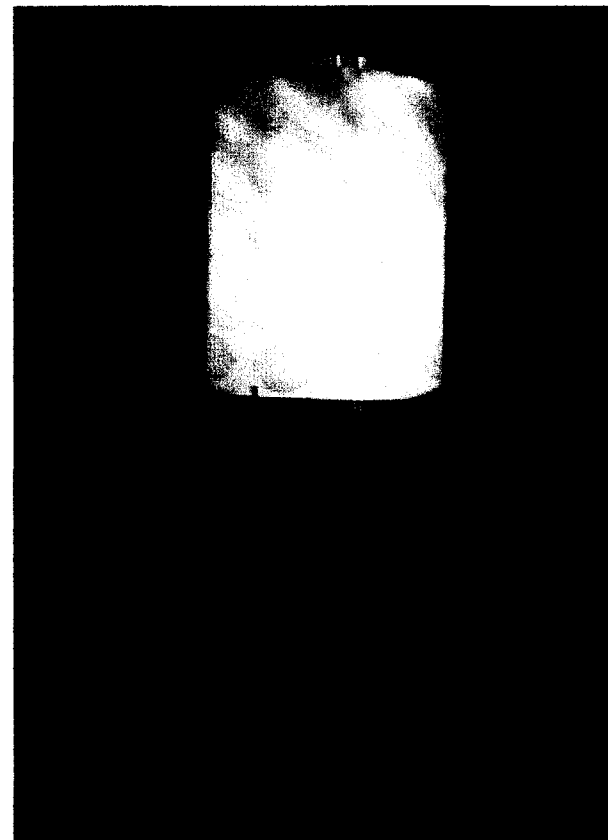
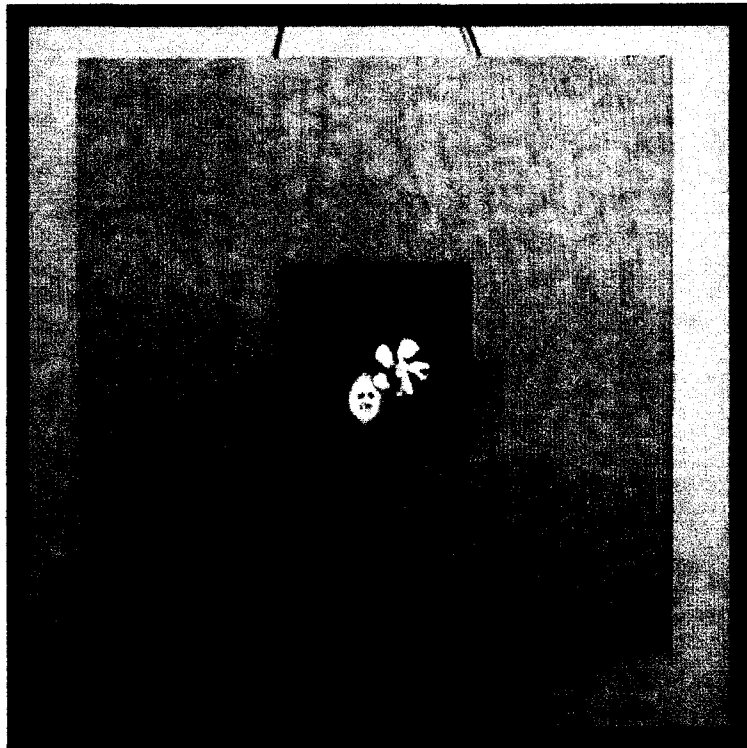
September 28, 1999

Interval Research Corp.

Wireless speakers

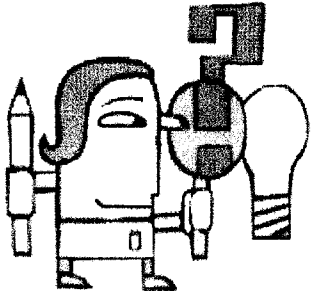


A Brave New World of Communication



September 28, 1999

Interval Research Corp.



The FCC's UWB Docket

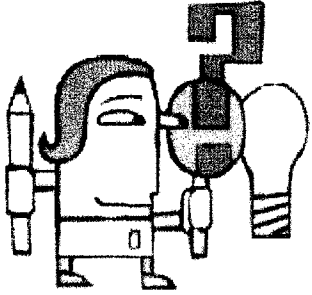
Interval applauds the FCC for its action on September 1, 1998 issuing a Notice of Inquiry ("NOI") on UWB devices.

Interest in promoting UWB devices is high. The NOI prompted over 40 commenters to submit their insights and ideas, and helped frame the important issues relating to the development of UWB applications.

There was strong support and general consensus for the development of UWB devices and applications.

Interval believes that the few objections to establishing new rules for UWB devices can be addressed, once speculative harms are disregarded.

U.S. has a lead on UWB with respect to the rest of the world.



Interval Contributes to UWB

Interval filed comments and reply comments in the NOI.

Interval co-founded the UWB Working Group (UWB-WG) in November 1998.

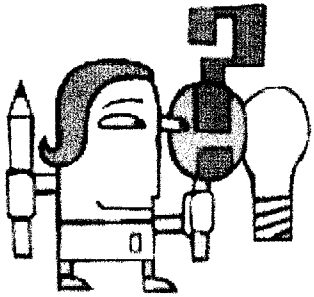
The purpose of the UWB-WG is to promote public policies that encourage the development and commercialization of UWB technologies.

The UWB-WG has approximately two dozen members, including research laboratories and entrepreneurs.

Interval provides sound scientific contributions.

Interval collaborates with universities to evaluate issues of co-existence with other users of the bands, especially in the restricted bands of operation.

Interval researches consumer's needs and technologies that will create new industries.



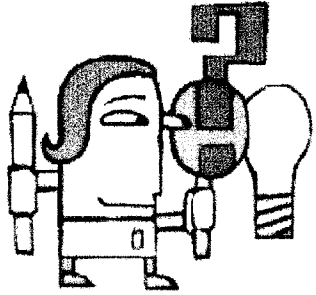
UWB Will Not Cause Harmful Interference

Concern:

- ◆ **UWB devices will cause harmful interference within the restricted bands of operation, including TV broadcast and GPS.**

Research results:

- ◆ **UWB systems operate using a very large bandwidth with very low power spectral density.**
- ◆ **GPS is the most critical system because of the combination of space-to-earth and safety-of-life application.**
- ◆ **An interference study in collaboration with Prof. Enge, GPS Research Group at Stanford University, demonstrates that UWB and GPS can coexist.**



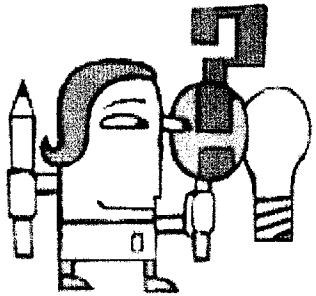
Aggregation of UWB Devices Will Not Increase Current Ambient Noise Levels

Concern:

- ◆ **Widespread and ubiquitous use of UWB devices will unacceptably increase current ambient noise levels.**

Research results:

- ◆ **Noise aggregation is caused by any radio transmitter, not just by UWB devices.**
- ◆ **Substantial noise aggregation will not occur because of:
signal attenuation, and
earth curvature.**
- ◆ **Empirical evidence from existing radio systems is consistent with our analysis.**



Interval's Recommendations

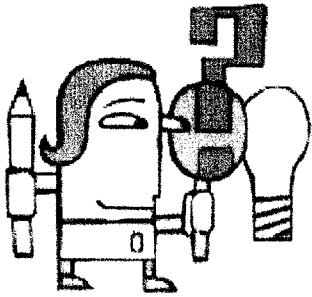
The FCC should continue to move forward and issue a Notice of Proposed Rulemaking ("NPRM") in January 2000.

The FCC should maintain the current levels of Part 15 for unintentional radiators.

The FCC should specify different limits for indoors/outdoors.

**The FCC should reduce the allowed level on the GPS band by 20dB
Pulse desensitization should not apply.**

The FCC should base the limits on measured E field.



Conclusions

In recent years, the FCC's initiative and foresight have given birth to many new radio-based technologies that will benefit society (e.g., spread spectrum, unlicensed NII devices, unlicensed PCS devices).

Once the FCC proposes specific rules in an NPRM, Interval is confident that any remaining objections can be worked out quickly by the interested parties.

Carefully crafted rules that address actual -- and not speculative -- harms should be the FCC's goal.

The public stands to greatly benefit from UWB devices which will not only enhance our daily lives, but also save lives.

The FCC should keep the momentum and the lead vis-a-vis the rest of the world.

Dr. G. Roberto Aiello

Dr. G. Roberto Aiello, who leads Interval's ultra-wideband team, has been a member of Interval's research staff since 1996. He has conducted research on wearable cameras, domestic communication, wireless networks and ultra-wideband technology. From 1988 to 1996 Dr. Aiello worked as a scientist and engineering manager at the Superconducting Super Collider Laboratory, Waxahachie, TX, operated by the Department of Energy, and at the Stanford Linear Accelerator Center.

In 1994, Dr. Aiello was Visiting Professor at the Arcetri Astrophysics Observatory, Arcetri, Italy, where he worked on the electronics design for the adaptive optics of the Large Binocular Telescope under construction on Mt. Graham in Arizona. From 1988 to 1990 he designed and built the optical diagnostics for Elettra, a third generation Synchrotron Radiation Source in Trieste, Italy. He has significantly contributed to the advance of beam diagnostics in the particle accelerator research community and has published extensively on that topic. Dr. Aiello received his Ph.D. in physics from the University of Trieste, Italy. He is a member of APS, IEEE and AAAS.

Debby Hindus

Debby Hindus is a Member of the Research Staff at Interval Research Corporation in Palo Alto, CA. Her current research interests include broadband applications in the home and wireless technologies. Earlier research addressed new kinds of audio-only computer-mediated communication. She has recently published on the intersection of consumers, communications, technology and the home. In 1999, Ms. Hindus taught a new Stanford course on The Design of Domestic and Consumer Technologies. She has also taught at Harvard University Extension. She is a senior member of the computer-human interaction research community.

Ms. Hindus holds an MS degree from the MIT Media Lab and a BSCS degree from the University of Michigan. While in the Media Lab's Speech Research group, her work focused on innovative speech applications for interacting with computers. Before her graduate studies Ms. Hindus worked at Digital Equipment Corporation in Maynard, MA. There she led commercial software development for a top-selling product. She then joined Software Arts in Wellesley, MA, the company that invented computer spreadsheets. Ms. Hindus has extensive industry experience developing software and consulting on user interfaces for such companies as John Hancock and Houghton-Mifflin. She holds one U.S. patent on audio conferencing.

**Interval Research Refocuses Activities
to Capture Broadband Opportunities**

PALO ALTO, Calif., September 23, 1999 - To create and capture new opportunities as broadband comes to people's homes, Interval is introducing a major focus to its agenda with work in digital home applications and devices, broadband web sites, and wireless home networks. The company also continues to conduct cutting-edge research in signal and media computation, reconfigurable computing, three-dimensional graphics, and demographic and lifestyle studies. Interval's new emphasis aligns closely with the wired world vision of its founder, Paul Allen.

To support this realignment, Arati Prabhakar has assumed the role of president, Technology Group; and Doug Solomon has assumed the role of president, Business Development Group. Together, they will share the leadership of the organization. Interval founder David Liddle will remain as chairman and continue to serve as an advisor to the company.

"When Paul and I first started Interval, it was intended as an unbounded research effort. Now that Paul's 'wired world' strategy and effort is taking flight, it makes sense for Interval to be able to support this strategy, find synergies with our sister companies, and seize broadband opportunities," said Liddle. "Having joined Interval last year, Arati and Doug are poised to take the helm and lead this exciting charge."

"As broadband unfolds, many of Interval's dreams about new possibilities for individuals can at last be made real. It's a great time for new thinking about applications and technologies," commented Prabhakar. "Working closely with our technologists, we are building a strong business development function that will rapidly bring Interval's technologies and business concepts to market, as well as incubating some exciting new broadband startups," said Solomon.

Prabhakar joined Interval Research with a distinguished career in research and development. Most recently, she was senior vice president and chief technology officer at Raychem Corporation. Previously, she held a U.S. Senate-confirmed Presidential appointment as a director of the National Institute of Standards and Technology (NIST), which works with companies on broad-based technologies for U.S. economic growth. While at NIST, she was responsible for the Advanced Technology Program, the NIST Laboratories, the Manufacturing Extension Partnership, and the Malcolm Baldrige National Quality Award. Prior to NIST, she was an office director for the Defense Advanced Research Projects Agency where she set strategic directions for and managed investments in electronics R&D projects in over 300 companies, universities and labs. Prabhakar was also a Congressional Fellow, conducting a study on critical issues in microelectronics.

Solomon joined Interval Research from Apple Computer where, most recently, he was senior vice president, Strategic Planning and Corporate Development. In Corporate Development since 1989, Doug worked with top Apple leaders to develop strategies for future business directions, to create business plans and to lead their implementations. He was responsible for mergers and acquisitions, investments, strategic planning, major alliances, and technology licensing.

Solomon had joined Apple Computer 1983 as manager, Education Products and was soon promoted to manager, Consumer and Education Products. From 1984 to 1989 he was Group Manager, Market Intelligence. Previously, Solomon was an independent consultant, advising a wide variety of private and public sector organizations on business and market strategy, market research and communication programs. He was a staff and faculty member at Stanford University from 1977 to 1983.

Interval's goal is to expand the ways in which people communicate, learn, relax and live with new technology. The company is a laboratory and incubator for new business around broadband applications and services, consumer devices, interaction design and advanced technologies. Interval brings an interdisciplinary approach to research. Its staff includes computer scientists, designers, engineers, filmmakers, and entrepreneurs. Interval's business development team works with the researchers and launches spin-out companies and partnerships to take concepts to market. Paul Allen and David Liddle founded Interval Research Corporation in 1992 to explore new directions in information technology and launch new businesses.

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